Amendments to the Claims:

This listing of claims will replace all prior versions and listings of claims in the application:

Listing of Claims:

1.　(Currently Amended) A method of shaping input packet traffic to form output packet traffic, said method comprising steps of:

specifying a probability parameter representing, in regard to a downstream buffer receiving said output packet traffic, the slope in the upper bound of (i) probability of buffer occupancy of the downstream buffer being exceeded versus (ii) buffer occupancy of the downstream buffer;

specifying a rate parameter representing the mean rate of the output packet traffic, wherein the rate parameter and the probability parameter satisfy a relationship imposing a predetermined probabilistic limit on burstiness of the output packet traffic; and

~~determining a constraint parameter dependent upon a probability density function; and~~

constraining, based upon ~~said~~ the probability parameter and the rate parameter, transmission of the input packet traffic, thereby to produce said output packet traffic ~~wherein the probability of buffer occupancy of a downstream buffer receiving said output traffic versus buffer occupancy of said downstream buffer has an upper bound which approaches a straight line in the large-buffer limit~~.

2-7.　(Cancelled)

8.　(Currently Amended) A packet traffic shaper for producing output packet traffic, the shaper comprising:

means for specifying a probability parameter representing, in regard to a downstream buffer receiving said output packet traffic, the slope in the upper bound of (i) probability of

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buffer occupancy of the downstream buffer being exceeded versus (ii) buffer occupancy of the downstream buffer;

means for specifying a rate parameter representing the mean rate of the output packet traffic, wherein the rate parameter and the probability parameter satisfy a relationship imposing a predetermined probabilistic limit on burstiness of the output packet traffic; and

~~determination means configured to determine a constraint parameter dependent upon a probability density function; and~~

constraining means configured to constrain, based upon the probability parameter and the rate parameter, transmission of traffic input to said ~~constraining means~~ shaper, thereby to produce said output packet traffic ~~wherein the probability of buffer occupancy of a downstream buffer receiving said output traffic versus buffer occupancy of said downstream buffer has an upper bound which approaches a straight line in the large buffer limit.~~

9-14.   (Cancelled)

15.   (Currently Amended) A computer readable memory medium for storing a program for an apparatus which shapes input packet traffic to form output packet traffic, said program comprising:

code for a specifying step for specifying a probability parameter representing, in regard to a downstream buffer receiving said output packet traffic, the slope in the upper bound of (i) probability of buffer occupancy of the downstream buffer being exceeded versus (ii) buffer occupancy of the downstream buffer;

code for a specifying step for specifying a rate parameter representing the mean rate of the output packet traffic, wherein the rate parameter and the probability parameter satisfy a relationship imposing a predetermined probabilistic limit on burstiness of the output packet traffic; and

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~~code for a determining step for determining a constraint parameter dependent upon a probability density function; and~~

code for a constraining step for constraining, based upon said <u>probability</u> parameter <u>and</u> <u>the rate parameter</u>, transmission of the input packet traffic, thereby to produce <u>said</u> output packet traffic ~~wherein the probability of buffer occupancy of a downstream buffer receiving said output traffic versus buffer occupancy of said downstream buffer has an upper bound which approaches a straight line in the large buffer limit.~~

16-28.   (Cancelled)

29.   (Currently Amended) A method of policing input packet traffic <u>to form output</u> <u>packet traffic</u>, said method comprising steps of:

<u>specifying a probability parameter representing, in regard to a downstream buffer</u> <u>receiving said output packet traffic, the slope in the upper bound of (i) probability of buffer</u> <u>occupancy of the downstream buffer being exceeded versus (ii) buffer occupancy of the</u> <u>downstream buffer;</u>

<u>specifying a rate parameter representing the mean rate of the output packet traffic,</u> <u>wherein the rate parameter and the probability parameter satisfy a relationship imposing a</u> <u>predetermined probabilistic limit on burstiness of the output packet traffic; and</u>

~~determining a constraint parameter dependent upon a probability density function; and~~

tagging, based upon said <u>probability</u> parameter <u>and the rate parameter</u>, conforming packets in the input packet traffic, thereby to produce <u>said</u> output packet traffic wherein tagged packets comprise a policed traffic stream ~~wherein the probability of buffer occupancy of a downstream buffer receiving said policed traffic stream versus buffer occupancy of said downstream buffer has an upper bound which approaches a straight line in the large buffer limit~~.

30-35.   (Cancelled)

36.   (Currently Amended) A packet traffic policer <u>for policing ionput packet traffic and producing policed output packet traffic, the policer</u> comprising:

<u>specifying means for specifying a probability parameter representing, in regard to a downstream buffer receiving said output packet traffic, the slope in the upper bound of (i) probability of buffer occupancy of the downstream buffer being exceeded versus (ii) buffer occupancy of the downstream buffer;</u>

<u>specifying means for specifying a rate parameter representing the mean rate of the output packet traffic, wherein the rate parameter and the probability parameter satisfy a relationship imposing a predetermined probabilistic limit on burstiness of the output packet traffic; and</u>

~~determination means configured to determine a constraint parameter dependent upon a probability density function; and~~

tagging means configured to tag, based upon the <u>probability</u> parameter <u>and the rate parameter,</u> conforming packets in traffic input to said ~~tagging means~~ <u>policer</u>, thereby to produce <u>said</u> output traffic wherein tagged packets comprise a policed traffic stream ~~wherein the probability of buffer occupancy of a downstream buffer receiving said policed traffic stream versus buffer occupancy of said downstream buffer has an upper bound which approaches a straight line in the large buffer limit~~.

37-42.   (Cancelled)

43.   (Currently Amended) A computer readable memory medium for storing a program for an apparatus which polices input packet traffic <u>to produce policed output packet traffic,</u> said program comprising:

<u>code for a specifying step for specifying a probability parameter representing, in regard to a downstream buffer receiving said output packet traffic, the slope in the upper bound of (i)</u>

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probability of buffer occupancy of the downstream buffer being exceeded versus (ii) buffer occupancy of the downstream buffer;

code for a specifying step for specifying a rate parameter representing the mean rate of the output packet traffic, wherein the rate parameter and the probability parameter satisfy a relationship imposing a predetermined probabilistic limit on burstiness of the output packet traffic; and

~~code for a determining step for determining a constraint parameter dependent upon a probability density function; and~~

code for a tagging step for tagging, based upon said probability parameter and the rate parameter, conforming packets in the input packet traffic, thereby to produce said output packet traffic wherein tagged packets comprise a policed traffic stream ~~wherein the probability of buffer occupancy of a downstream buffer receiving said policed traffic stream versus buffer occupancy of said downstream buffer has an upper bound which approaches a straight line in the large buffer limit~~.

44-56.   (Cancelled)

57.   (Original) A method of controlling admission of a proposed additional input packet traffic stream to a network node, said node having a prior input packet traffic stream, and an output packet traffic stream carried on a link having an associated maximum bandwidth, said method comprising steps of:

shaping the prior input packet traffic stream to have a corresponding pre-determined entropy bound if said prior stream does not have said corresponding pre-determined entropy bound;

shaping the proposed additional input packet traffic stream to have a corresponding pre-determined entropy bound if said proposed stream does not have said corresponding pre-determined entropy bound;

determining corresponding equivalent bandwidths for the prior traffic stream and the proposed additional traffic stream; and

admitting the proposed additional traffic stream if a sum of the corresponding equivalent

bandwidths of the prior traffic stream and the proposed additional traffic stream does not exceed

said maximum bandwidth.

58.   (Original) A connection admission controller configured to control admission of a

proposed additional input packet traffic stream to a network node, said node having a prior input

packet traffic stream, and an output packet traffic stream carried on a link having an associated

maximum bandwidth, said controller comprising:

first shaping means configured to shape the prior input packet traffic stream to have a

corresponding pre-determined entropy bound if said prior stream does not have said

corresponding pre-determined entropy bound;

second shaping means configured to shape the proposed additional input packet traffic

stream to have a corresponding pre-determined entropy bound if said proposed stream does not

have said corresponding pre-determined entropy bound;

determining means configured to determine corresponding equivalent bandwidths for the

prior traffic stream and the proposed additional traffic stream; and

admission means configured to admit the proposed additional traffic stream if a sum of

the corresponding equivalent bandwidths of the prior traffic stream and the proposed additional

traffic stream does not exceed said maximum bandwidth.

59.   (Original) A computer readable memory medium for storing a program for an

apparatus which controls admission of a proposed additional input packet traffic stream to a

network node, said node having a prior input packet traffic stream, and an output packet traffic

stream carried on a link having an associated maximum bandwidth, said program comprising:

code for a first shaping step for shaping the prior input packet traffic stream to have a

corresponding pre-determined entropy bound if said prior stream does not have said

corresponding pre-determined entropy bound;

code for a second shaping step for shaping the proposed additional input packet traffic

stream to have a corresponding pre-determined entropy bound if said proposed stream does not

have said corresponding pre-determined entropy bound;

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code for a determining step for determining corresponding equivalent bandwidths for the prior traffic stream and the proposed additional traffic stream; and

code for an admitting step for admitting the proposed additional traffic stream if a sum of the corresponding equivalent bandwidths of the prior traffic stream and the proposed additional traffic stream does not exceed said maximum bandwidth.

60-72.   (Cancelled)

73.   (New)   A method according to claim 1, wherein the predetermined probabilistic limit imposed by the relationship satisfied by the rate parameter and the probability parameter is exponential bounded burstiness.

74.   (New)   A method according to claim 1, wherein the relationship imposing the probabilistic limit on burstiness has the following mathematical representation:

$$\Pr\{O(t) - O(s) \le (t - s)\rho + f(\alpha, x)\} \le F(\alpha, \sigma); \text{ for all times } s(0 \le s \le t);$$

where:

Pr is the probability operator;

$O(t)$ is the number of bits in the output packet traffic in the time interval $[0, t]$;

ρ is the rate parameter;

α is the probability parameter;

x is a uniform random variate $x(0 \le x \le 1)$;

F is a distribution function involving parameters α and σ.

f is the inverse function of F; and

σ is the size of a given burst.

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75. (New) A method according to claim 74, where the functions F and f have the following mathematical representations:

$$F(\alpha, \sigma) = 1 - e^{-\alpha\sigma};$$

$$f(\alpha, x) = (1/\alpha) \log [1-x]^{-1};$$ and the relationship imposing the probabilistic limit on burstiness has the following mathematical representation:

$$\Pr\{O(t) - O(s) \geq (t - s)\rho + \sigma\} \leq e^{-\alpha\sigma}:$$

in which case the probabilistic limit imposed by the relationship satisfied by the rate parameter and the probability parameter is exponential bounded burstiness.

76. (New) A packet traffic shaper according to claim 8, wherein the predetermined probabilistic limit imposed by the relationship satisfied by the rate parameter and the probability parameter is exponential bounded burstiness.

77. (New) A packet traffic shaper according to claim 8, wherein the relationship imposing the probabilistic limit on burstiness has the following mathematical representation:

$$\Pr\{O(t) - O(s) \leq (t - s)\rho + f(\alpha, x)\} \leq F(\alpha, \sigma); \text{ for all times } s(0 \leq s \leq t);$$

where:

Pr is the probability operator;

$O(t)$ is the number of bits in the output packet traffic in the time interval $[0,t]$;

ρ is the rate parameter;

α is the probability parameter;

x is a uniform random variate $x(0 \leq x \leq 1)$;

F is a distribution function involving parameters α and σ.

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f is the inverse function of F; and

σ is the size of a given burst.

78. (New) A packet traffic shaper according to claim 77, where the functions F and f

have the following mathematical representations:

$F(\alpha,\sigma) = 1 - e^{-\alpha\sigma}$;

f (α,x) = $(1/\alpha)$ log $[1-x]^{-1}$; and the relationship imposing the probabilistic limit on

burstiness has the following mathematical representation:

$\Pr\{O(t) - O(s) \geq (t - s)\rho + \sigma\} \leq e^{-\alpha\sigma}$:

in which case the probabilistic limit imposed by the relationship satisfied by the rate parameter

and the probability parameter is exponential bounded burstiness.

79. (New) A computer readable memory medium according to claim 15, wherein the

predetermined probabilistic limit imposed by the relationship satisfied by the rate parameter and

the probability parameter is exponential bounded burstiness.

80. (New) A computer readable memory medium according to claim 15, wherein the

relationship imposing the probabilistic limit on burstiness has the following mathematical

representation:

$\Pr\{O(t) - O(s) \leq (t - s)\rho + f(\alpha, x)\} \leq F(\alpha, \sigma)$; for all times $s(0 \leq s \leq t)$;

where:

Pr is the probability operator;

$O(t)$ is the number of bits in the output packet traffic in the time interval $[0,t]$;

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ρ is the rate parameter;

α is the probability parameter;

x is a uniform random variate $x(0 \leq x \leq 1)$;

F is a distribution function involving parameters α and σ.

f is the inverse function of F; and

σ is the size of a given burst.

81. (New) A computer readable memory medium according to claim 80, where the functions F and f have the following mathematical representations:

$F(\alpha,\sigma) = 1 - e^{-\alpha\sigma}$;

$f(\alpha,x) = (1/\alpha) \log [1-x]^{-1}$; and the relationship imposing the probabilistic limit on burstiness has the following mathematical representation:

$\Pr\{O(t) - O(s) \geq (t - s)\rho + \sigma\} \leq e^{-\alpha\sigma}$:

in which case the probabilistic limit imposed by the relationship satisfied by the rate parameter and the probability parameter is exponential bounded burstiness.

82. (New) A method of policing according to claim 29, wherein the predetermined probabilistic limit imposed by the relationship satisfied by the rate parameter and the probability parameter is exponential bounded burstiness.

83. (New) A method of policing according to claim 29, wherein the relationship imposing the probabilistic limit on burstiness has the following mathematical representation:

$\Pr\{O(t) - O(s) \leq (t - s)\rho + f(\alpha, x)\} \leq F(\alpha, \sigma)$; for all times $s(0 \leq s \leq t)$:

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where:

Pr is the probability operator;

$O(t)$ is the number of bits in the output packet traffic in the time interval $[0,t]$;

ρ is the rate parameter;

α is the probability parameter;

x is a uniform random variate $x(0 \le x \le 1)$;

F is a distribution function involving parameters α and σ.

f is the inverse function of F; and

σ is the size of a given burst.

84. (New) A method of policing according to claim 83, where the functions F and f have the following mathematical representations:

$$F(\alpha,\sigma) = 1 - e^{-\alpha\sigma};$$

$f(\alpha,x) = (1/\alpha) \log [1-x]^{-1}$; and the relationship imposing the probabilistic limit on burstiness has the following mathematical representation:

$$\Pr\{O(t) - O(s) \ge (t - s)\rho + \sigma\} \le e^{-\alpha\sigma}:$$

in which case the probabilistic limit imposed by the relationship satisfied by the rate parameter and the probability parameter is exponential bounded burstiness.

85. (New) A packet traffic policer according to claim 36, wherein the predetermined probabilistic limit imposed by the relationship satisfied by the rate parameter and the probability parameter is exponential bounded burstiness.

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86. (New) A packet traffic policer according to claim 36, wherein the relationship imposing the probabilistic limit on burstiness has the following mathematical representation:

$$Pr\{O(t) - O(s) \leq (t - s)\rho + f(\alpha, x)\} \leq F(\alpha, \sigma); \text{ for all times } s(0 \leq s \leq t);$$

where:

Pr is the probability operator;

$O(t)$ is the number of bits in the output packet traffic in the time interval $[0, t]$;

ρ is the rate parameter;

α is the probability parameter;

x is a uniform random variate $x(0 \leq x \leq 1)$;

F is a distribution function involving parameters α and σ.

f is the inverse function of F; and

σ is the size of a given burst.

87. (New) A packet traffic policer according to claim 86, where the functions F and f have the following mathematical representations:

$$F(\alpha, \sigma) = 1 - e^{-\alpha\sigma};$$

$f(\alpha, x) = (1/\alpha) \log [1-x]^{-1}$; and the relationship imposing the probabilistic limit on burstiness has the following mathematical representation:

$$Pr\{O(t) - O(s) \geq (t - s)\rho + \sigma\} \leq e^{-\alpha\sigma}:$$

in which case the probabilistic limit imposed by the relationship satisfied by the rate parameter and the probability parameter is exponential bounded burstiness.

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88. (New) A computer readable memory medium according to claim 43, wherein the predetermined probabilistic limit imposed by the relationship satisfied by the rate parameter and the probability parameter is exponential bounded burstiness.

89. (New) A computer readable memory medium according to claim 43, wherein the relationship imposing the probabilistic limit on burstiness has the following mathematical representation:

$$\Pr\{O(t) - O(s) \leq (t - s)\rho + f(\alpha, x)\} \leq F(\alpha, \sigma); \text{ for all times } s(0 \leq s \leq t);$$

where:

Pr is the probability operator;

$O(t)$ is the number of bits in the output packet traffic in the time interval $[0,t]$;

ρ is the rate parameter;

α is the probability parameter;

x is a uniform random variate $x(0 \leq x \leq 1)$;

F is a distribution function involving parameters α and σ.

f is the inverse function of F; and

σ is the size of a given burst.

90. (New) A computer readable memory medium according to claim 89, where the functions F and f have the following mathematical representations:

$$F(\alpha,\sigma) = 1 - e^{-\alpha\sigma};$$

$$f(\alpha,x) = (1/\alpha) \log [1-x]^{-1};$$ and the relationship imposing the probabilistic limit on burstiness has the following mathematical representation:

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$$\Pr\{O(t) - O(s) \geq (t-s)\rho + \sigma\} \leq e^{-\alpha\sigma}:$$

in which case the probabilistic limit imposed by the relationship satisfied by the rate parameter

and the probability parameter is exponential bounded burstiness.

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